



2022-08-11

11th AP VALVES & STRUCTURAL HEART 2022



Show, Ask & Listen: To be Over or Under, That's the Question with Calcium?

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Case 1

#16974995

83/M

C/C Dyspnea

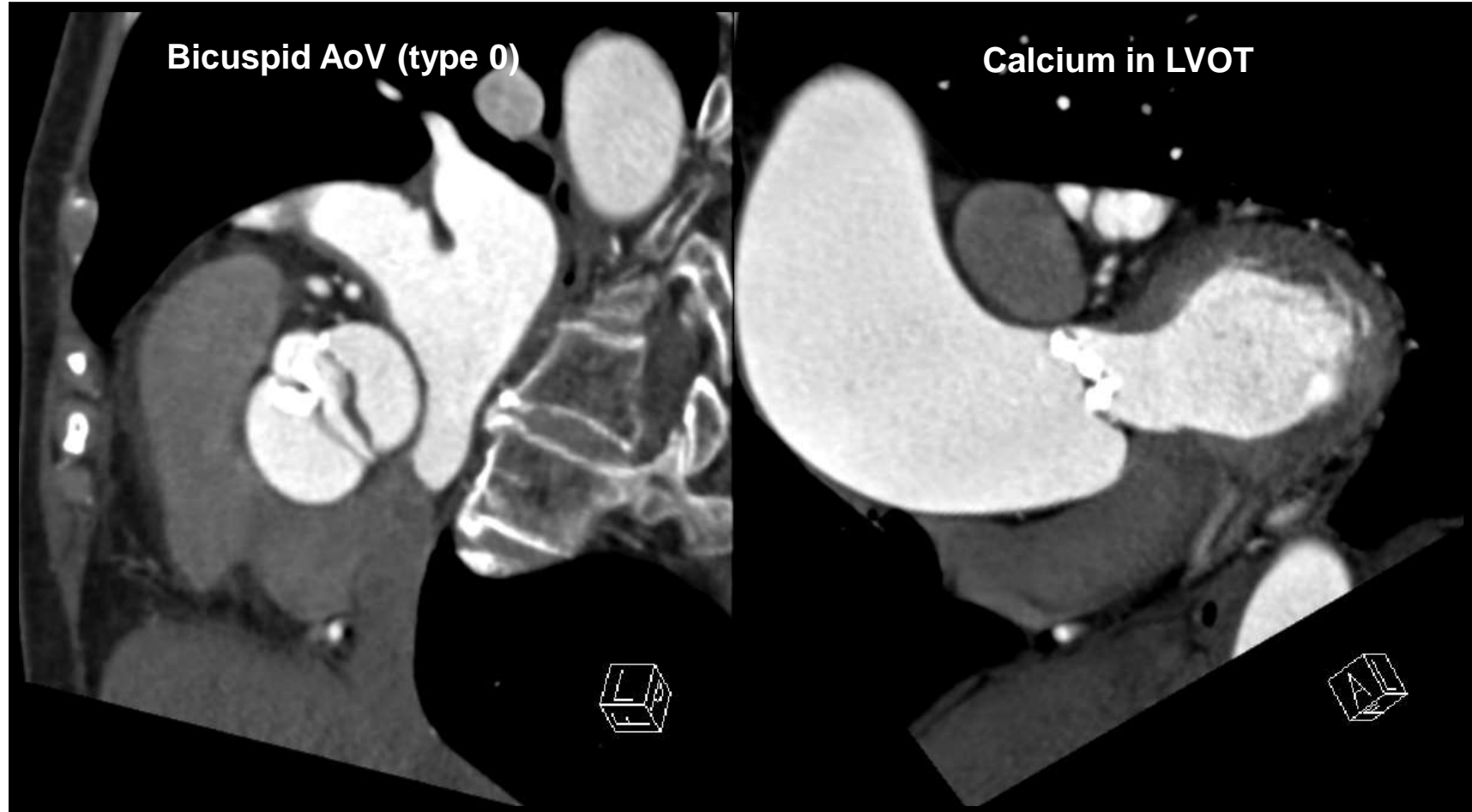
P/H HTN, Ascending aortic aneurysm
No known Hx. of DM, pulmonary TBc

V/S	BP	120 / 70 mmHg	BT	36.4 °C
	PR	74 /min	RR	20 /min

2DE Severe AS with bicuspid AoV
(AVA 0.64cm², Vmax 4.66m/s, meanPG 45.34mmHg)

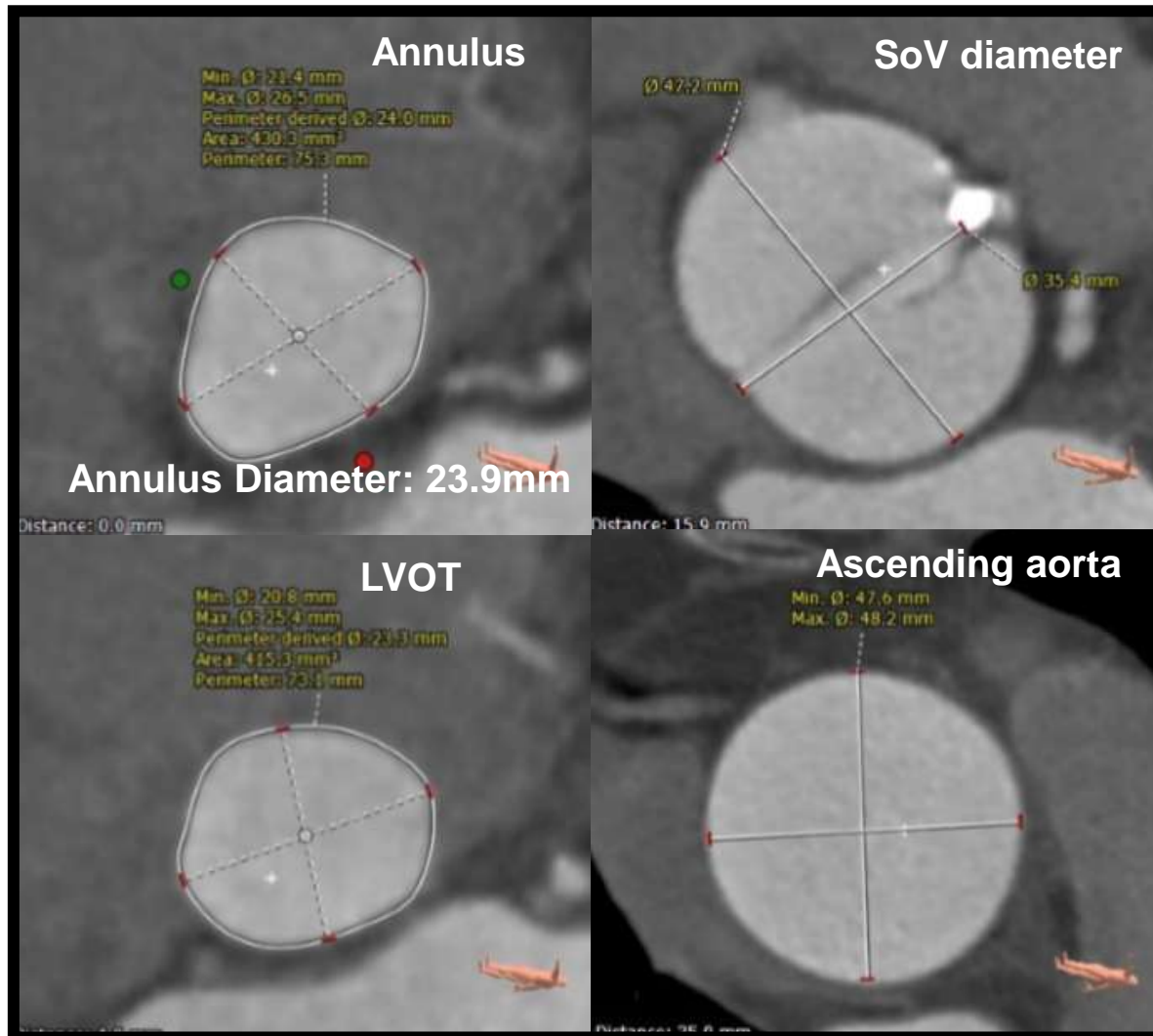
Before procedure

MDCT measurements

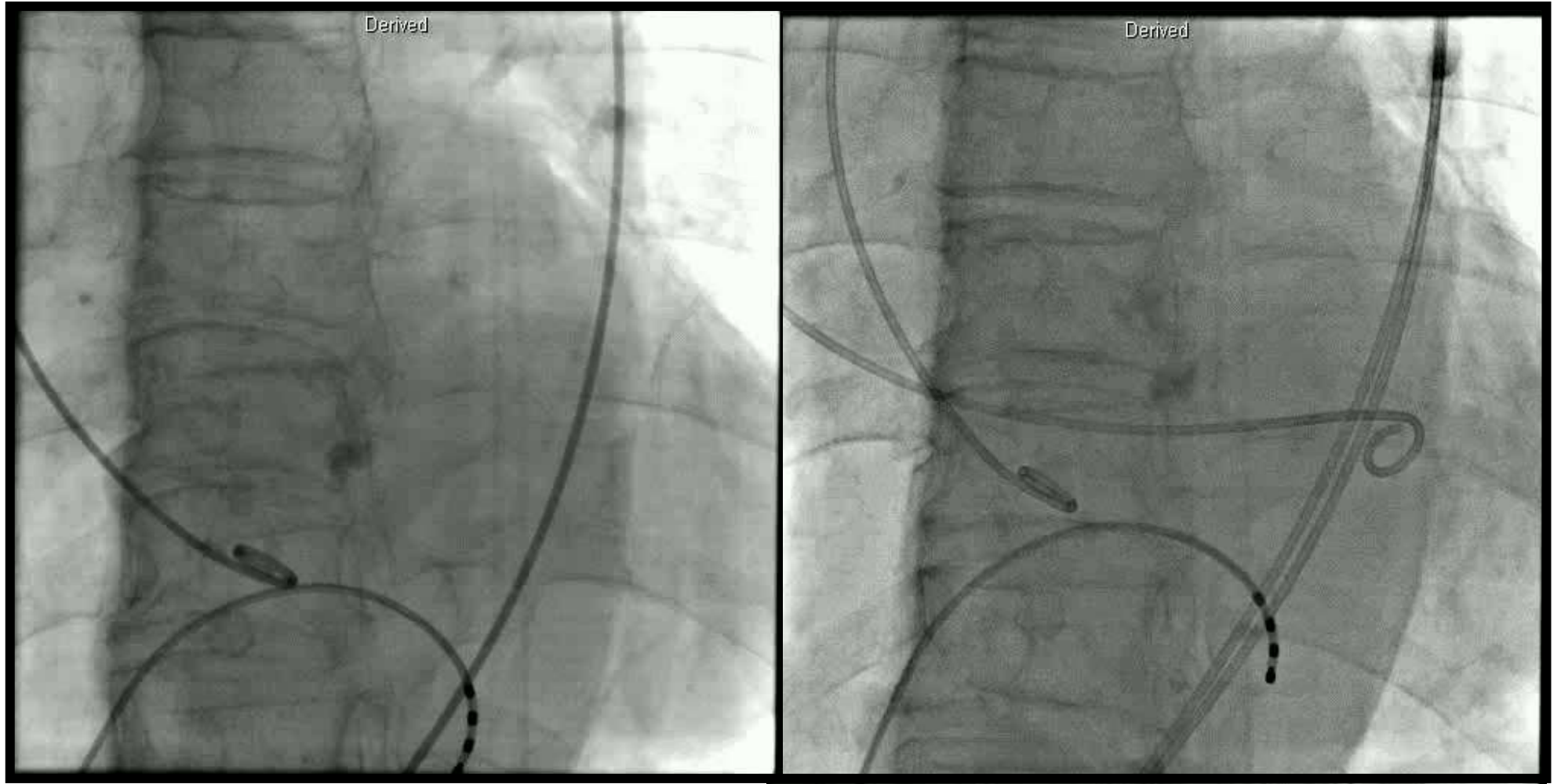


Before procedure

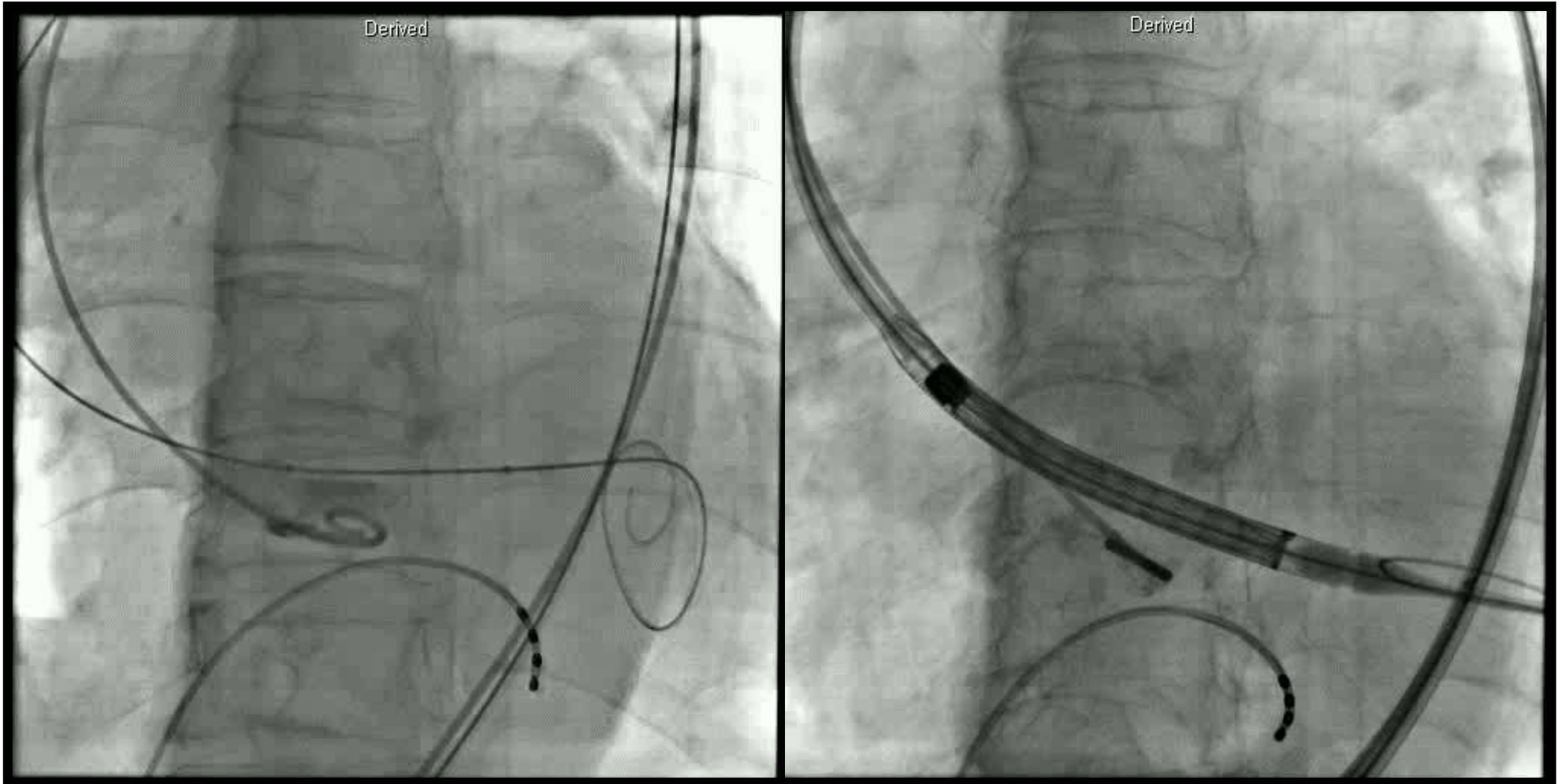
MDCT measurements



TAVI



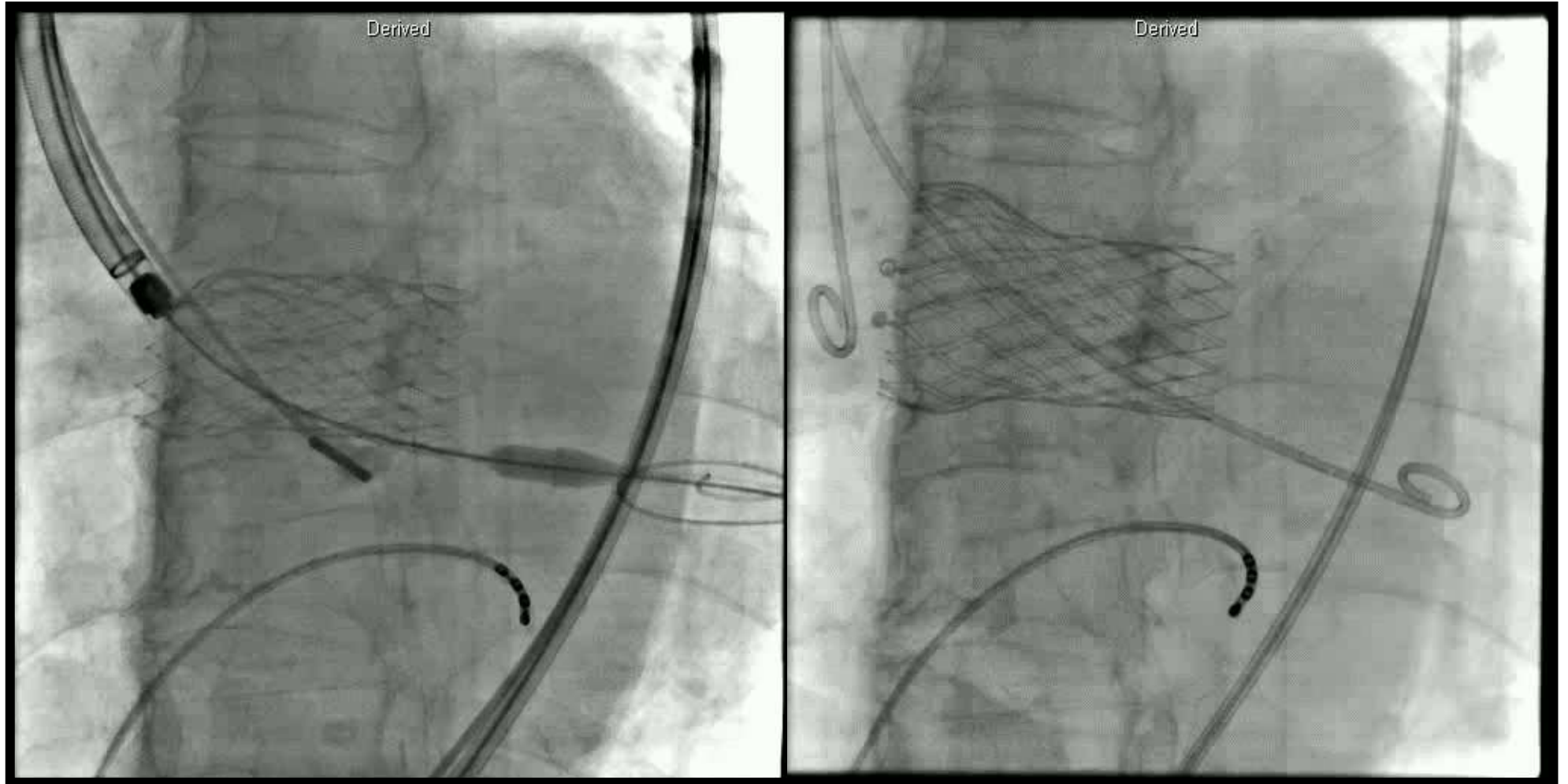
TAVI



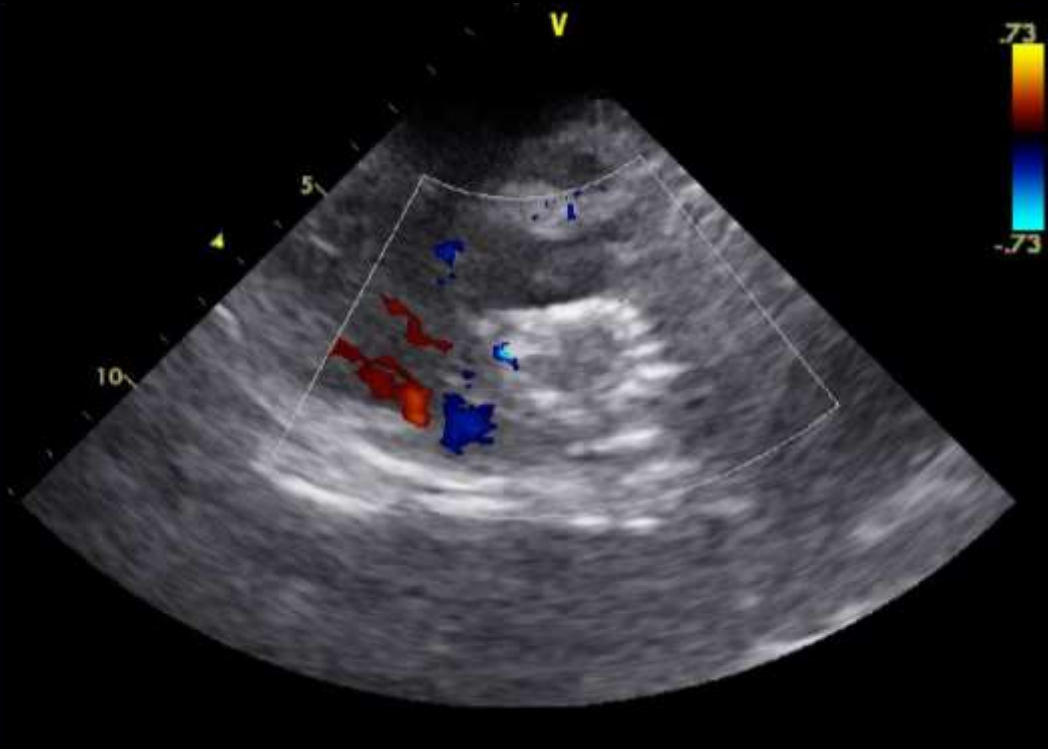
Pre-dilation

**Evolut PRO 29mm
(Oversizing percentage 21%)**

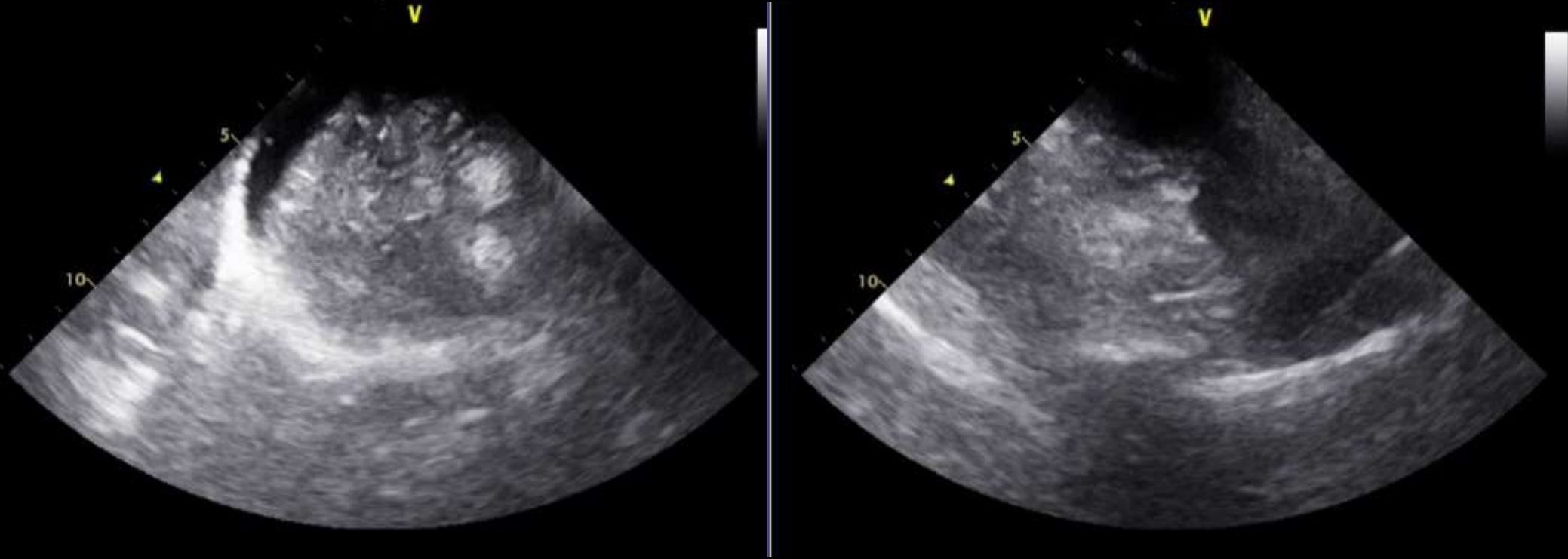
TAVI



Transthoracic echocardiography

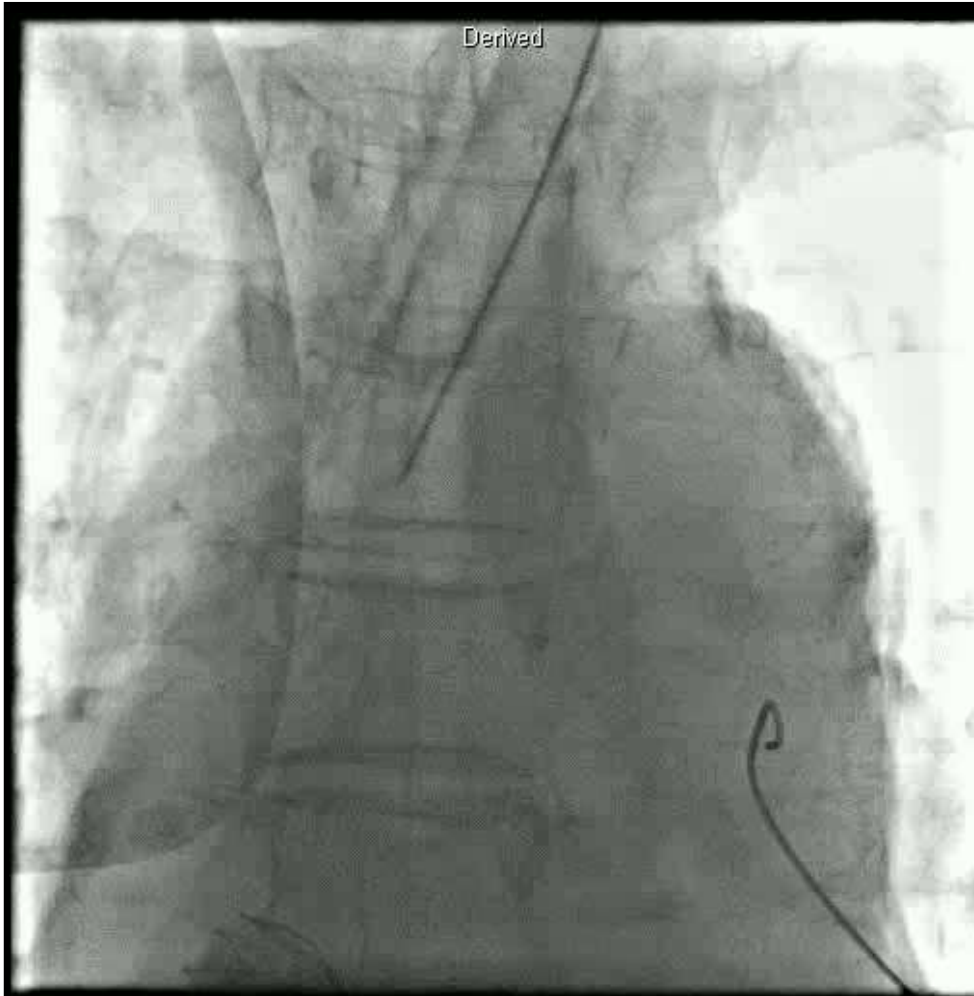


Transthoracic echocardiography

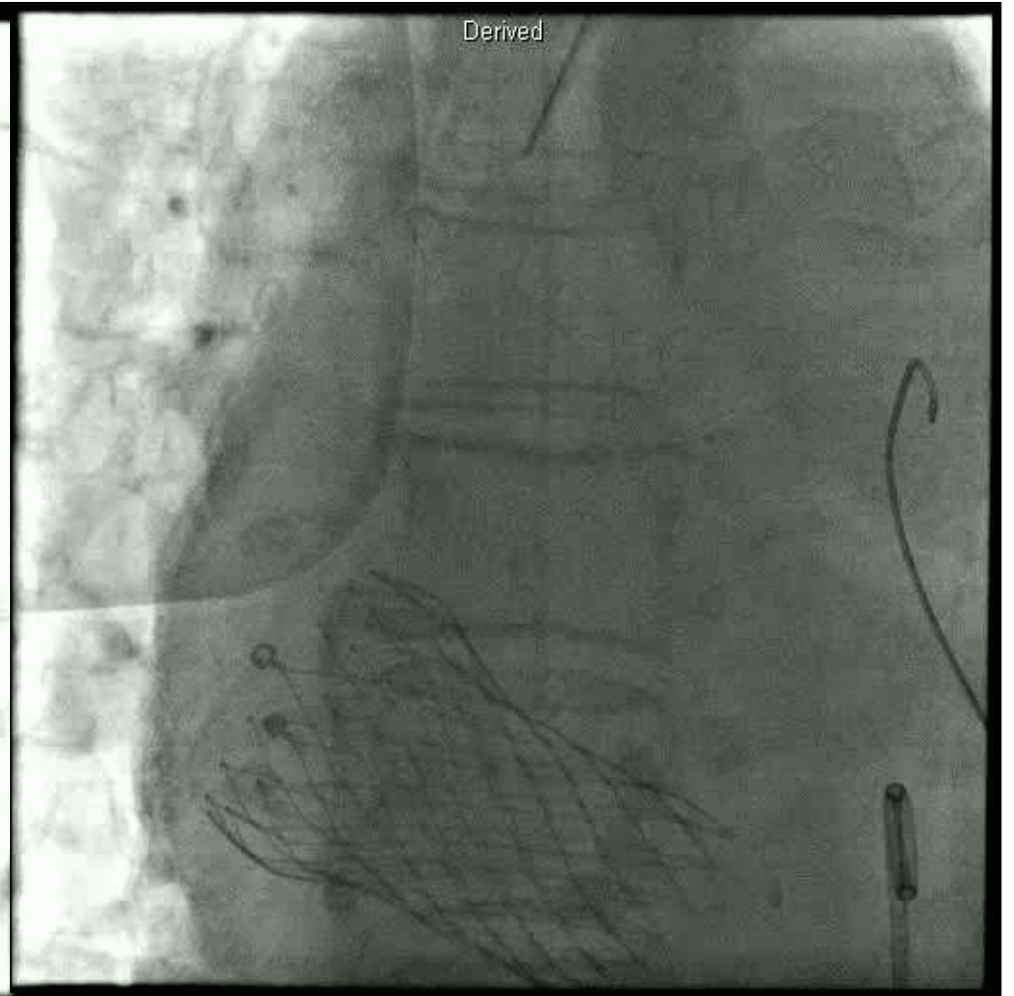


Mental change, BP drop & SpO2 80% -> Intubation/TTE f/u

TAVI

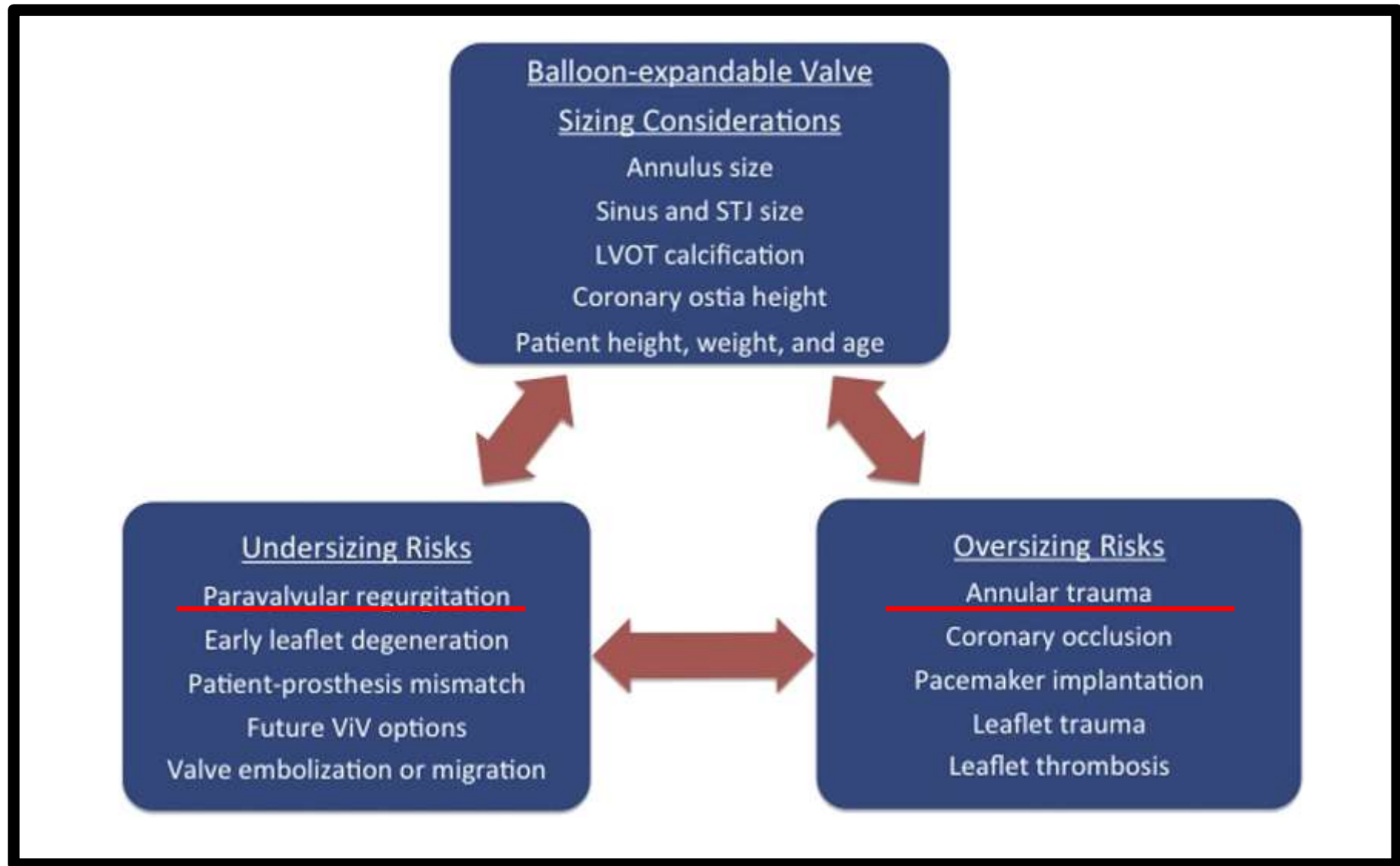


Pericardiostomy



Pigtail catheter insertion

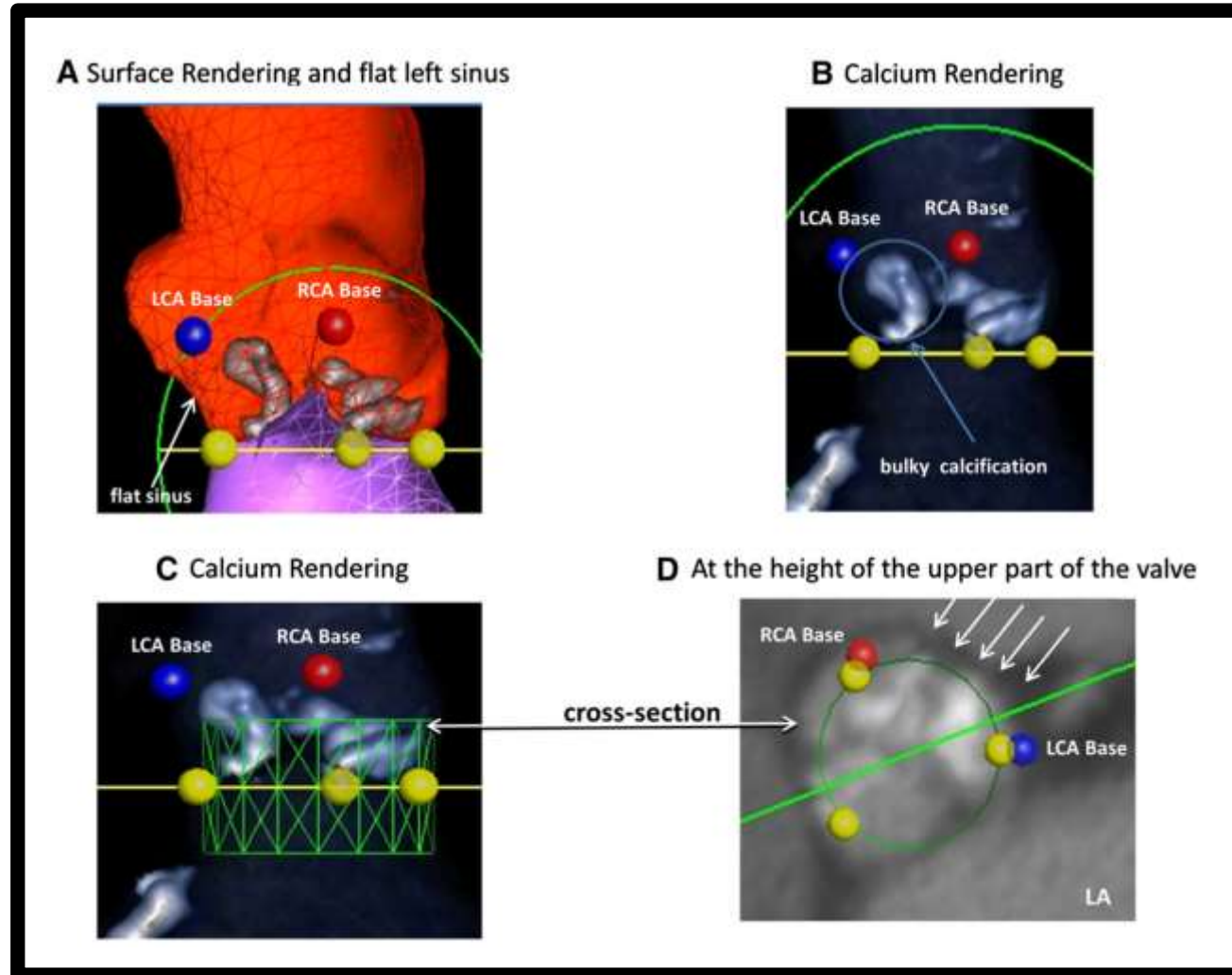
Optimal Sizing of Balloon Expandable Valve



Landing Zone Rupture

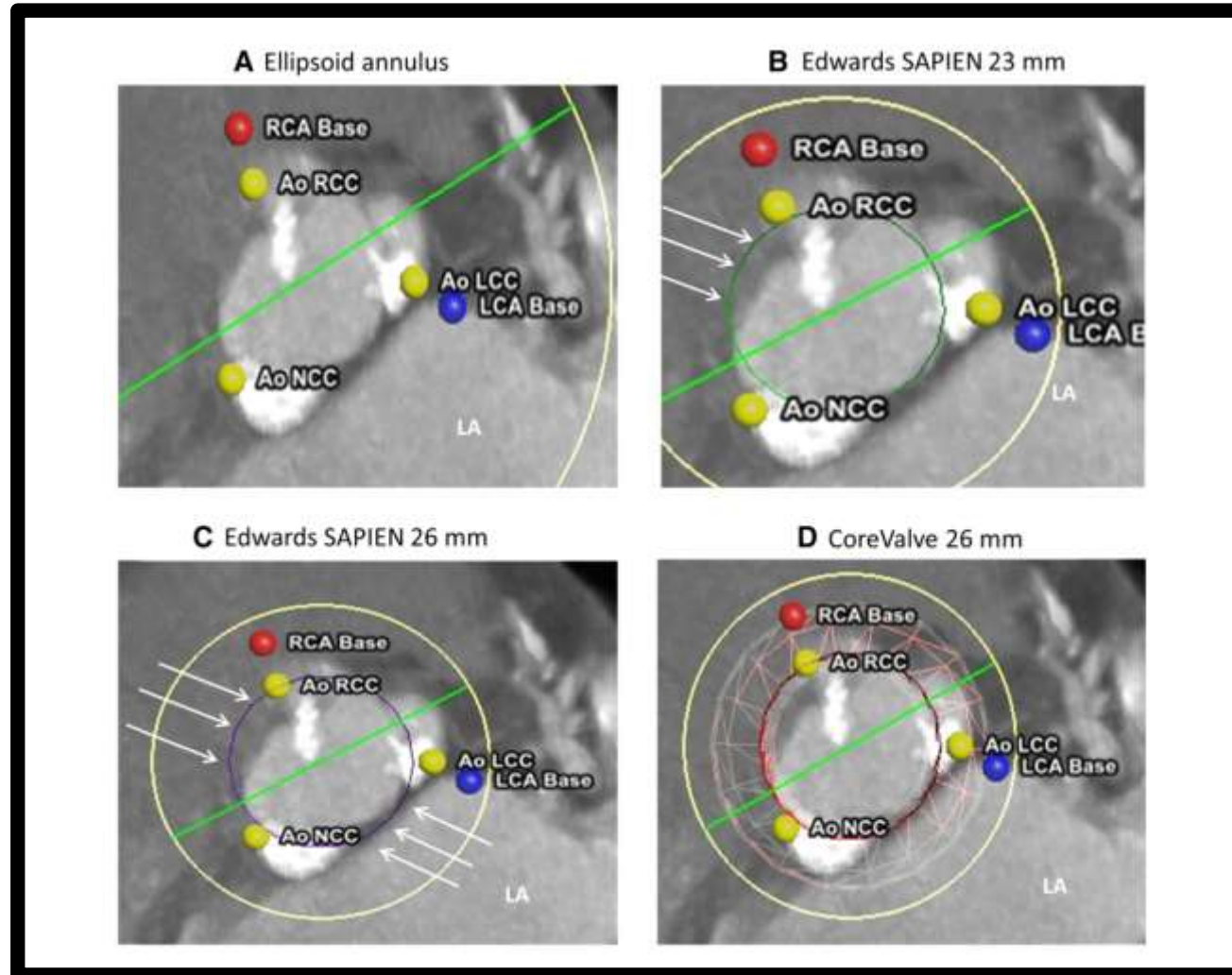
Transfemoral TAVR: procedural planning		
	Risk assessment	Preventive measures
<input type="checkbox"/> Vascular access Default: <ul style="list-style-type: none"> MDCT assessment of iliac-femoral axis Contralateral safety wire 	High risk <ul style="list-style-type: none"> Deep femoral arteries Femoral anterior wall calcification Peripheral vascular disease Sheath-to-femoral artery ratio >1.05 Female gender 	<ul style="list-style-type: none"> US-guidance or AGU technique Prefer transradial secondary access Consider surgical cut-down
<input type="checkbox"/> Conduction disturbances Default: <ul style="list-style-type: none"> Baseline ECG 	Low risk <ul style="list-style-type: none"> No baseline ECG abnormalities 	<ul style="list-style-type: none"> Rapid pacing via LV-guidewire
<input type="checkbox"/> Coronary occlusion Default: <ul style="list-style-type: none"> MDCT assessment for coronary height 	High risk <ul style="list-style-type: none"> RBBB AV block I High-grade AV block 	<ul style="list-style-type: none"> Rapid pacing via TPW Consider upfront PPM Prefer valves with low PPM rate
<input type="checkbox"/> Coronary occlusion Default: <ul style="list-style-type: none"> MDCT assessment for coronary height 	High risk <ul style="list-style-type: none"> LMS < 10 mm Valve-in-valve (especially in sutureless valve) 	<ul style="list-style-type: none"> Wire-protection technique Consider jailed balloon/stent protection technique Prefer repositionable valves
<input type="checkbox"/> Landing zone rupture Default: <ul style="list-style-type: none"> MDCT assessment of calcium distribution and anatomy 	High risk <ul style="list-style-type: none"> High calcium volume in the annular region and upper LVOT Shallow sinuses of Valsalva 	<ul style="list-style-type: none"> Prefer self-expandable valve Avoid post-dilatation Avoid oversizing >20%
<input type="checkbox"/> Stroke Default: <ul style="list-style-type: none"> MDCT assessment of aortic atherosclerosis Anamnestic risk factors 	High risk <ul style="list-style-type: none"> High calcium aortic valve volume Female gender History of stroke Peripheral vascular disease 	<ul style="list-style-type: none"> Minimize intra-aortic maneuvers Consider CEPD (prefer device with complete cerebral circulation protection)

Supra-annular rupture



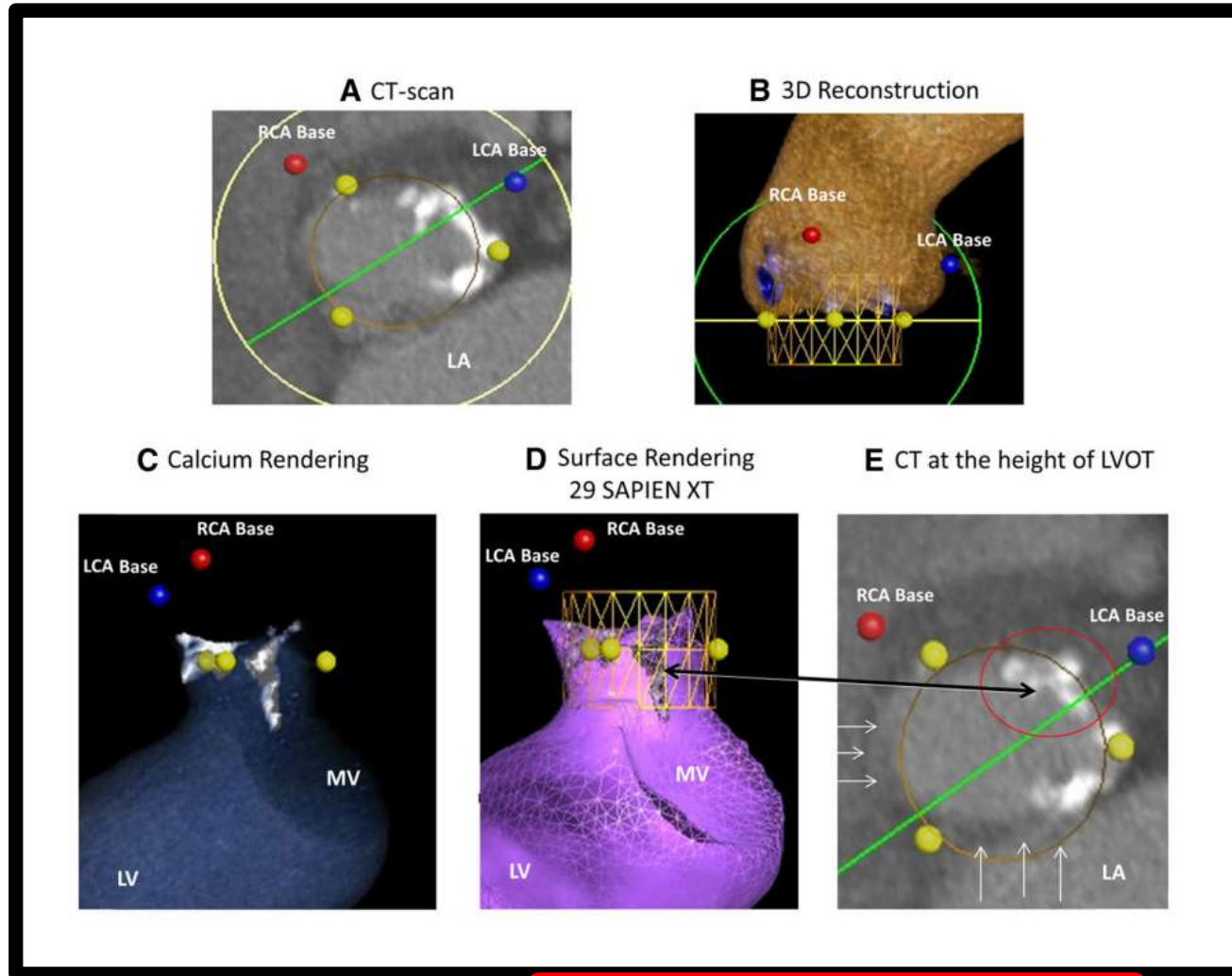
Flat sinuses of Valsalva and severe calcifications of either the body or the free edge of the cusps

Annular rupture



An ellipsoid annulus and bulky calcifications on either the base of the cusps or the rim of the annulus

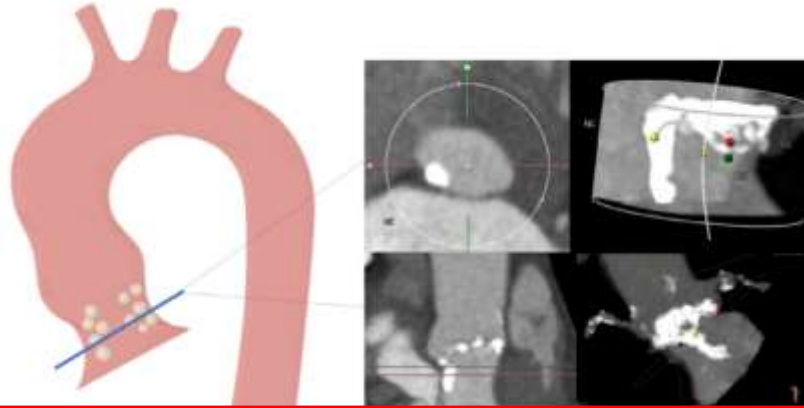
Subannular rupture



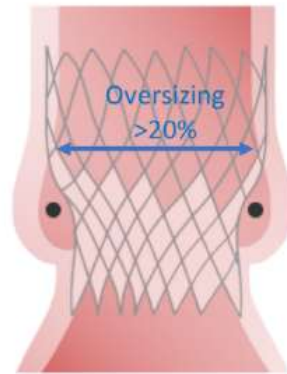
A narrow LVOT and bulky calcification of the LVOT

Landing Zone Rupture

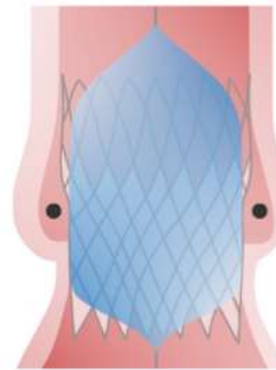
Procedural and anatomic risk factors



Presence of high-risk calcium distribution

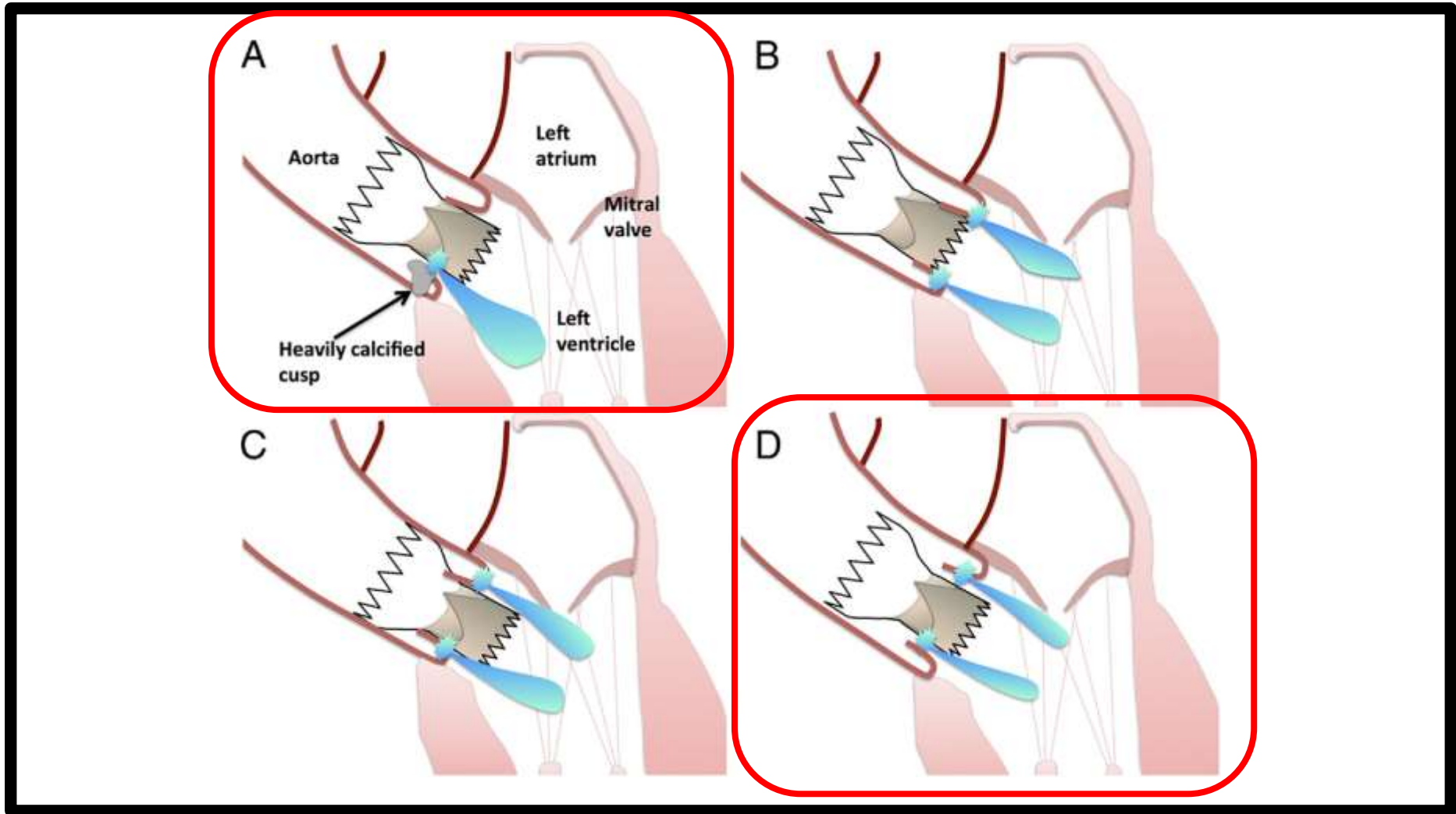


>20% area oversizing



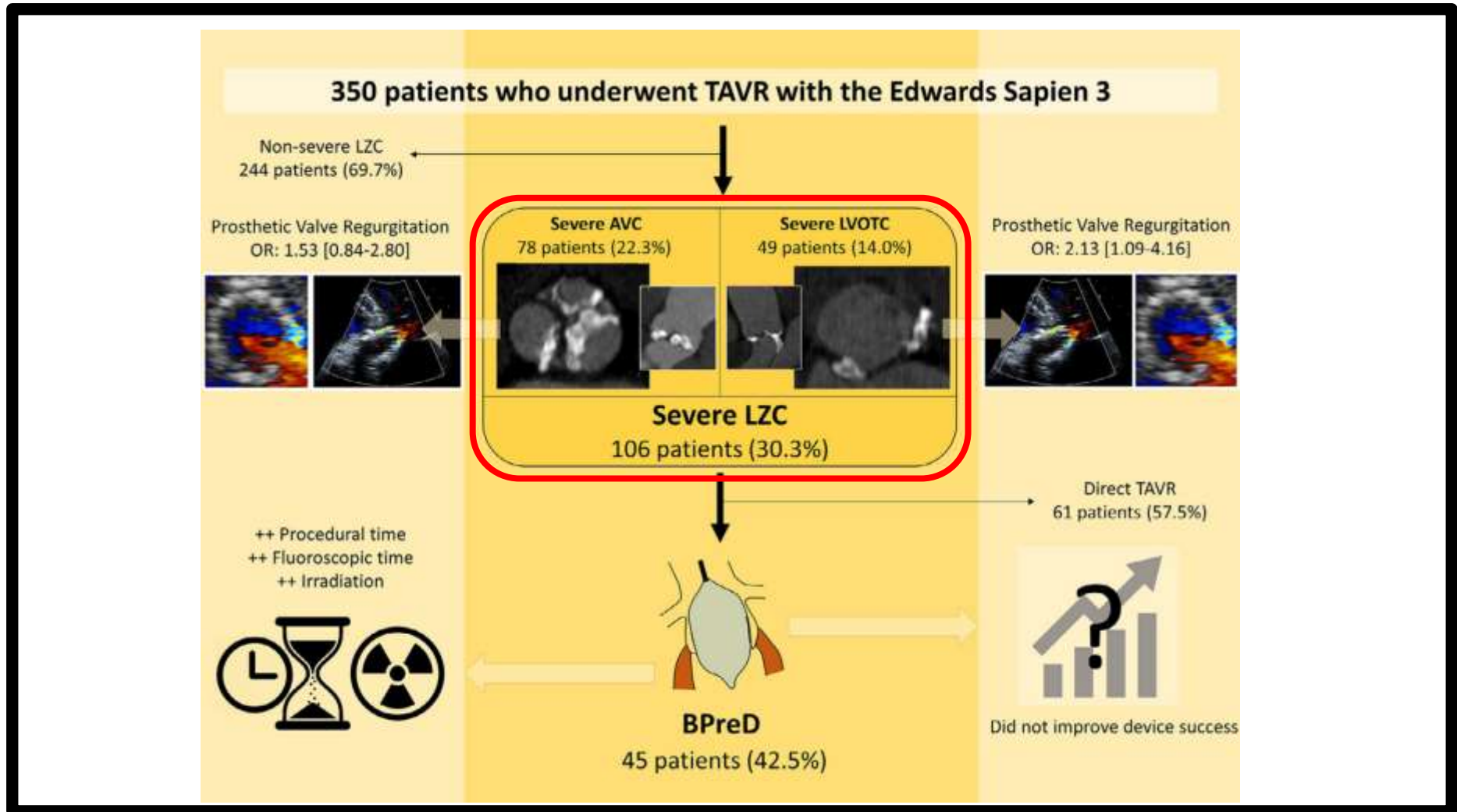
Postdilatation

Paravalvular Leakage



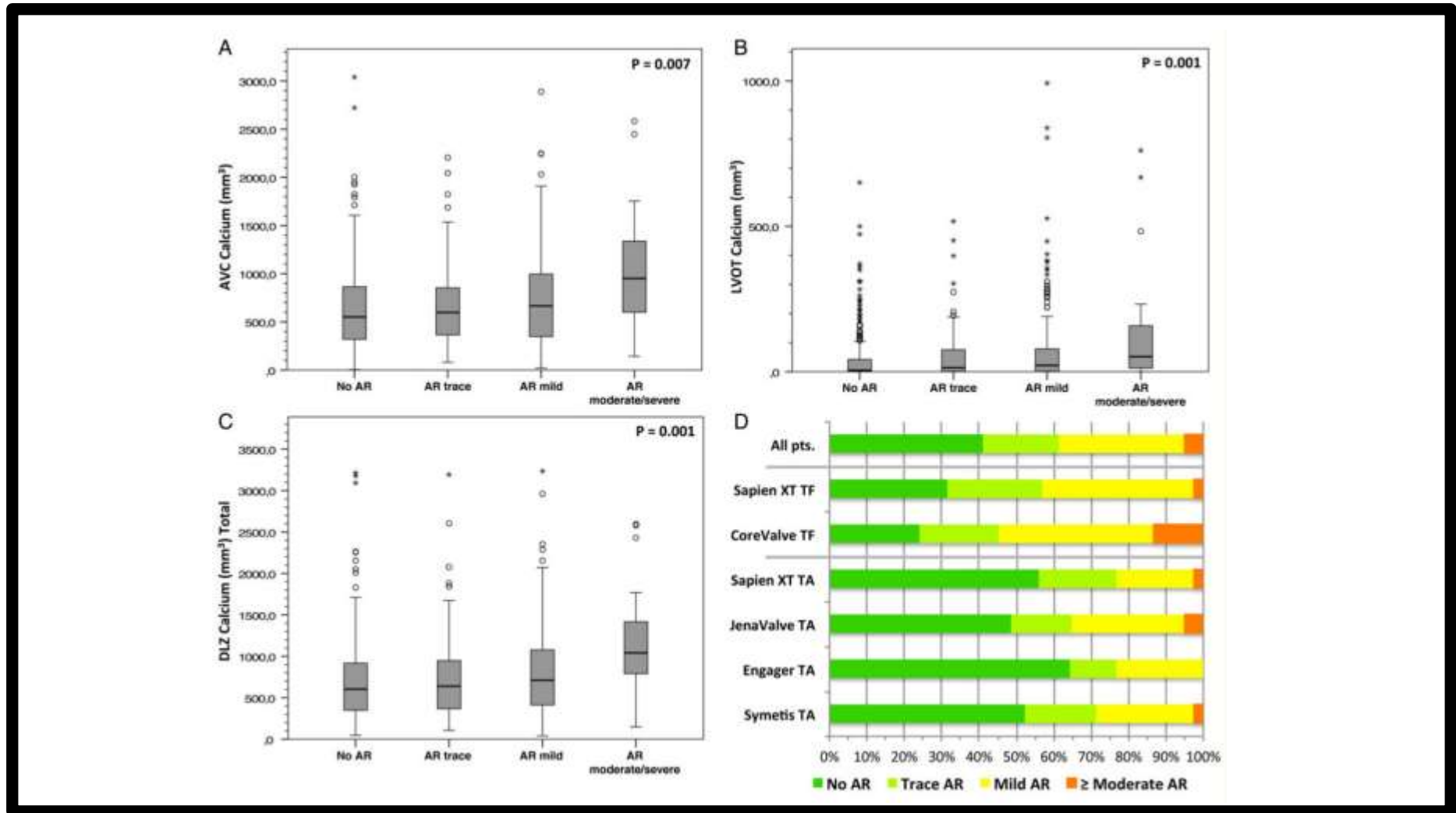
PVL with consecutive peri-prosthetic AR result from under-expansion of the prosthesis stent frame, which might be caused by calcifications of the annulus/the cusps or annulus-prosthesis size mismatch

Paravalvular Leakage



Device success of the SAPIEN 3 is lower in severe LVC driven by more PVR, especially in patients with severe LVOTC








Paravalvular Leakage



Calcium volumes of the aortic valve and left-ventricular outflow tract were associated with residual AR

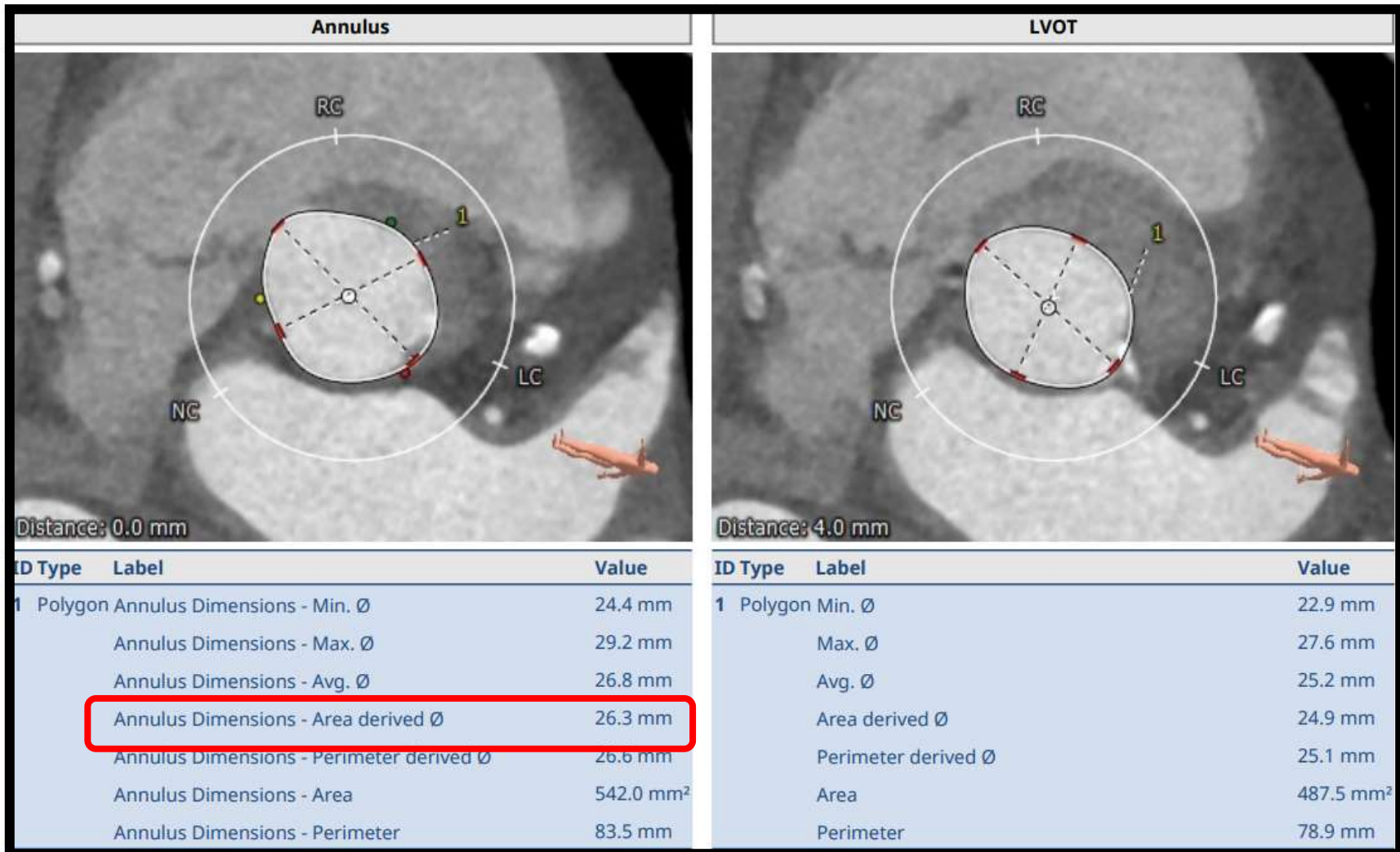
Paravalvular Leakage

CENTRAL ILLUSTRATION: Strengths and Weaknesses of Transcatheter Aortic Valve Replacement in Bicuspid Aortic Anatomy

Transcatheter Aortic Valve Replacement (TAVR)			
	Tricuspid	vs.	Bicuspid
			
Device success			Similar frequency in bicuspid aortic valve and tricuspid aortic valve anatomy (RR: 1.01), also in a cohort with matched characteristics (RR: 0.96)
1-year mortality			Similar frequency in bicuspid aortic valve and tricuspid aortic valve anatomy (RR: 1.10), also in a cohort with matched characteristics (RR: 0.91)
Periprocedural complications			Increased frequency in bicuspid aortic valve anatomy (RR: 1.12), but not in a cohort with matched characteristics (RR: 1.00) <i>Higher risk in bicuspid aortic valve with self-expanding valves and new generation devices.</i>
Paravalvular leak (moderate-severe)			Increased frequency in bicuspid aortic valve anatomy (RR: 1.42) <u>Lower frequency with balloon-expandable valves.</u>
Cerebral ischemic events			Increased occurrence in bicuspid aortic valve anatomy (Incidence Rate: 2.4% vs 1.6%)
Annulus rupture			Increased occurrence in bicuspid aortic valve anatomy (Incidence Rate: 0.3% vs 0.02%)

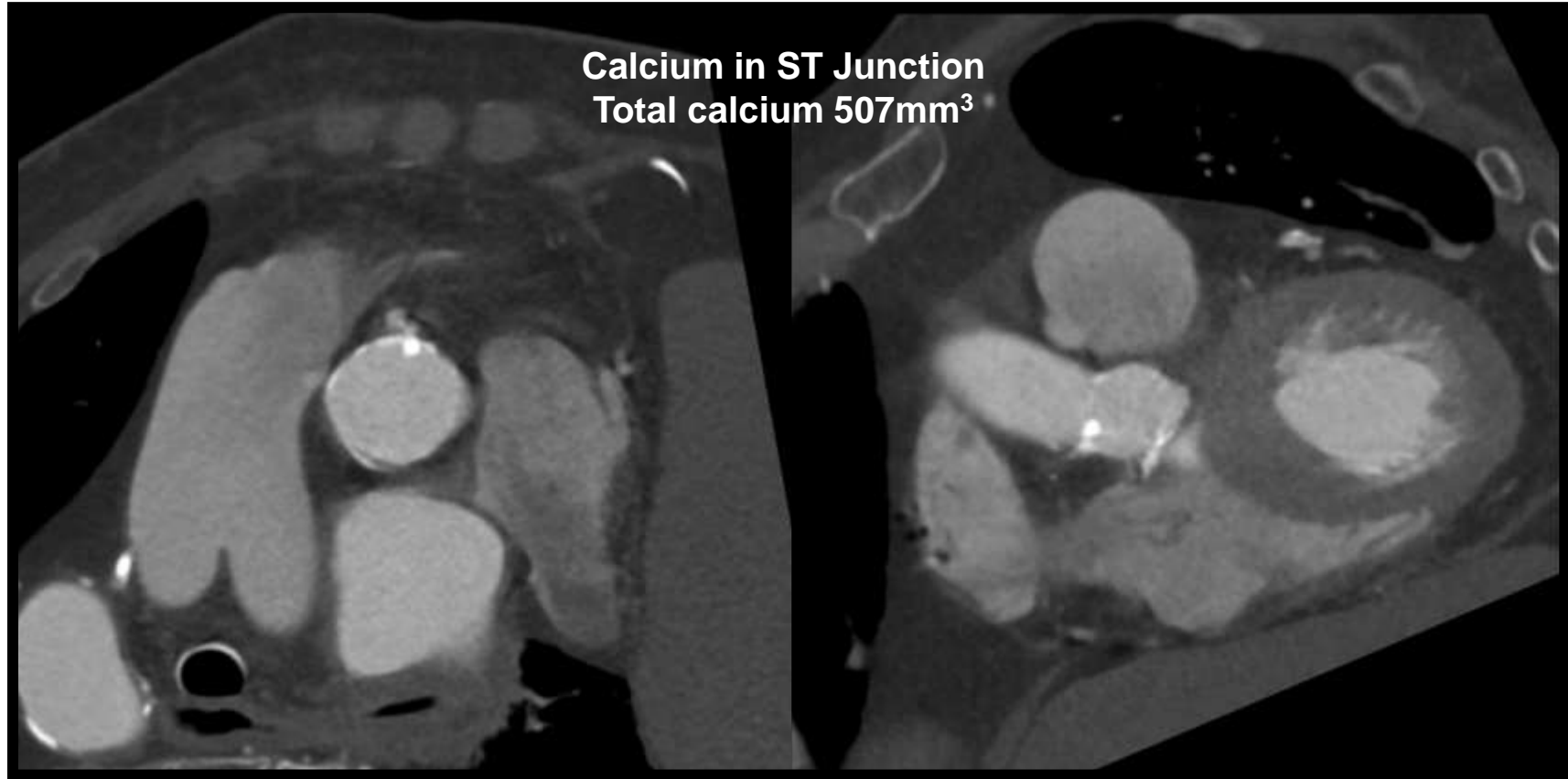
Before procedure

MDCT measurements

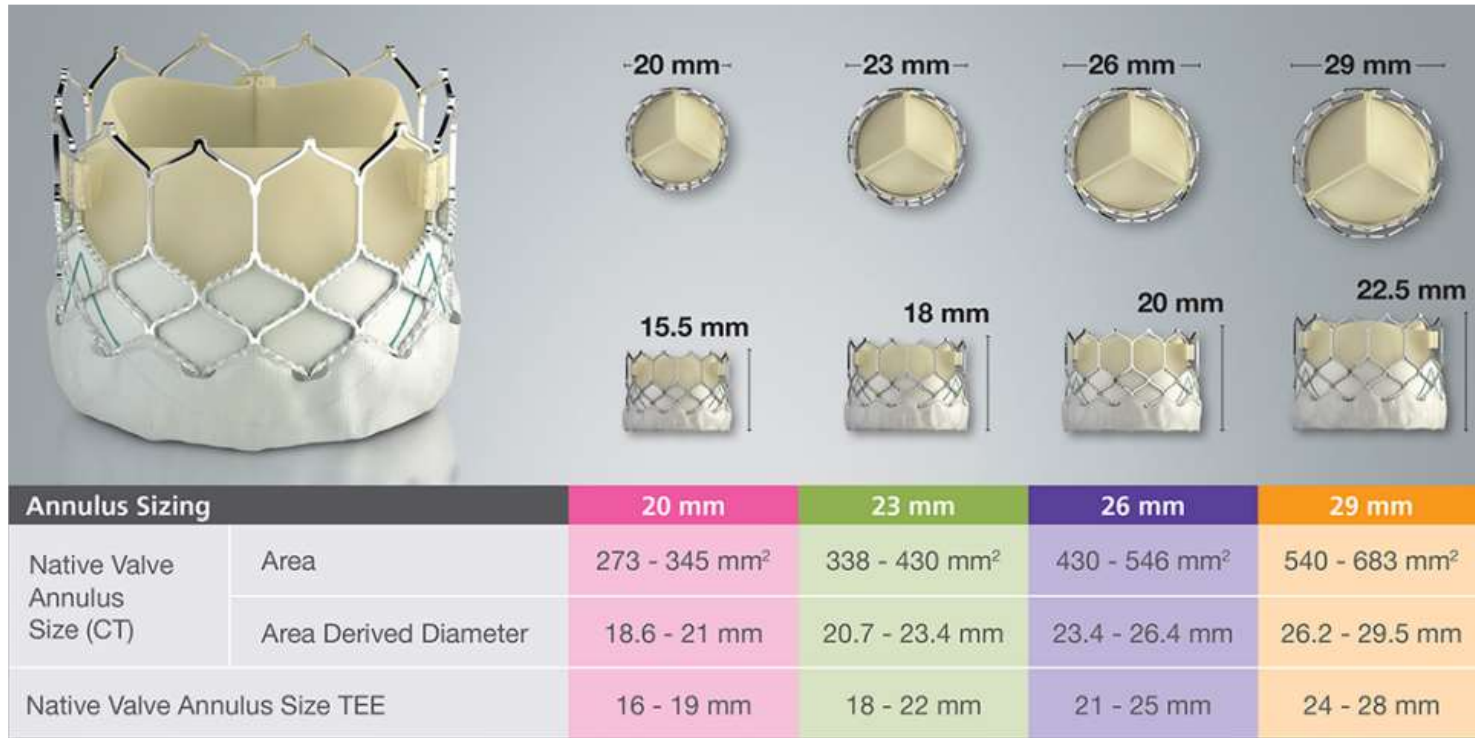


Before procedure

MDCT measurements



Optimal Ballooning of SAPINE 3 Valve



풍선확장형 판막은 측정된 판륜 크기보다 5~15% **oversizing**이 되도록 valve size를 선정한다.

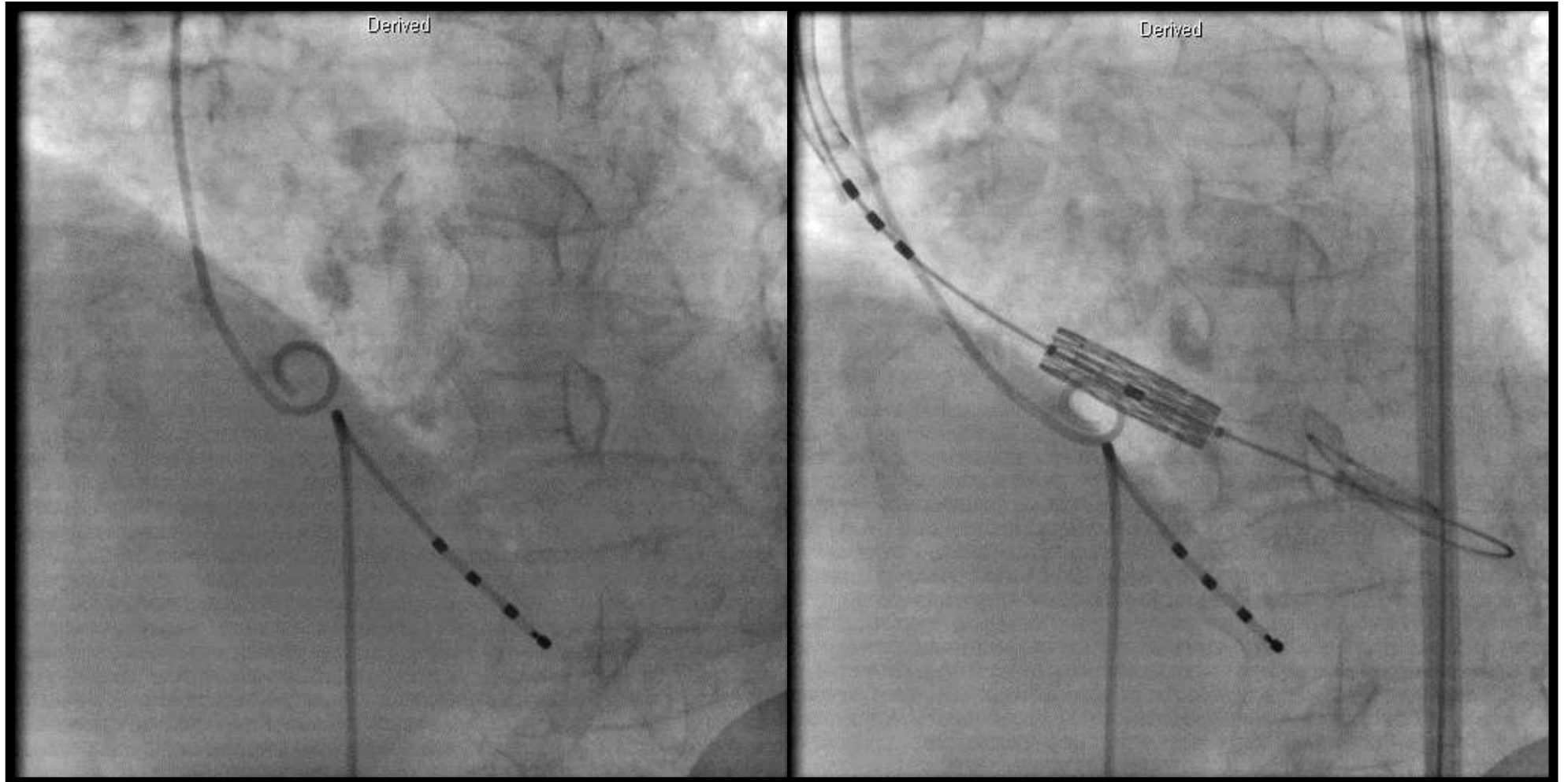
20% 이상의 **oversizing**은 annular rupture 위험이 크고, 5% 이하의 **oversizing**은 paravalvular leakage 발생할 가능성이 크다.

Before procedure

Selection of Valve Size

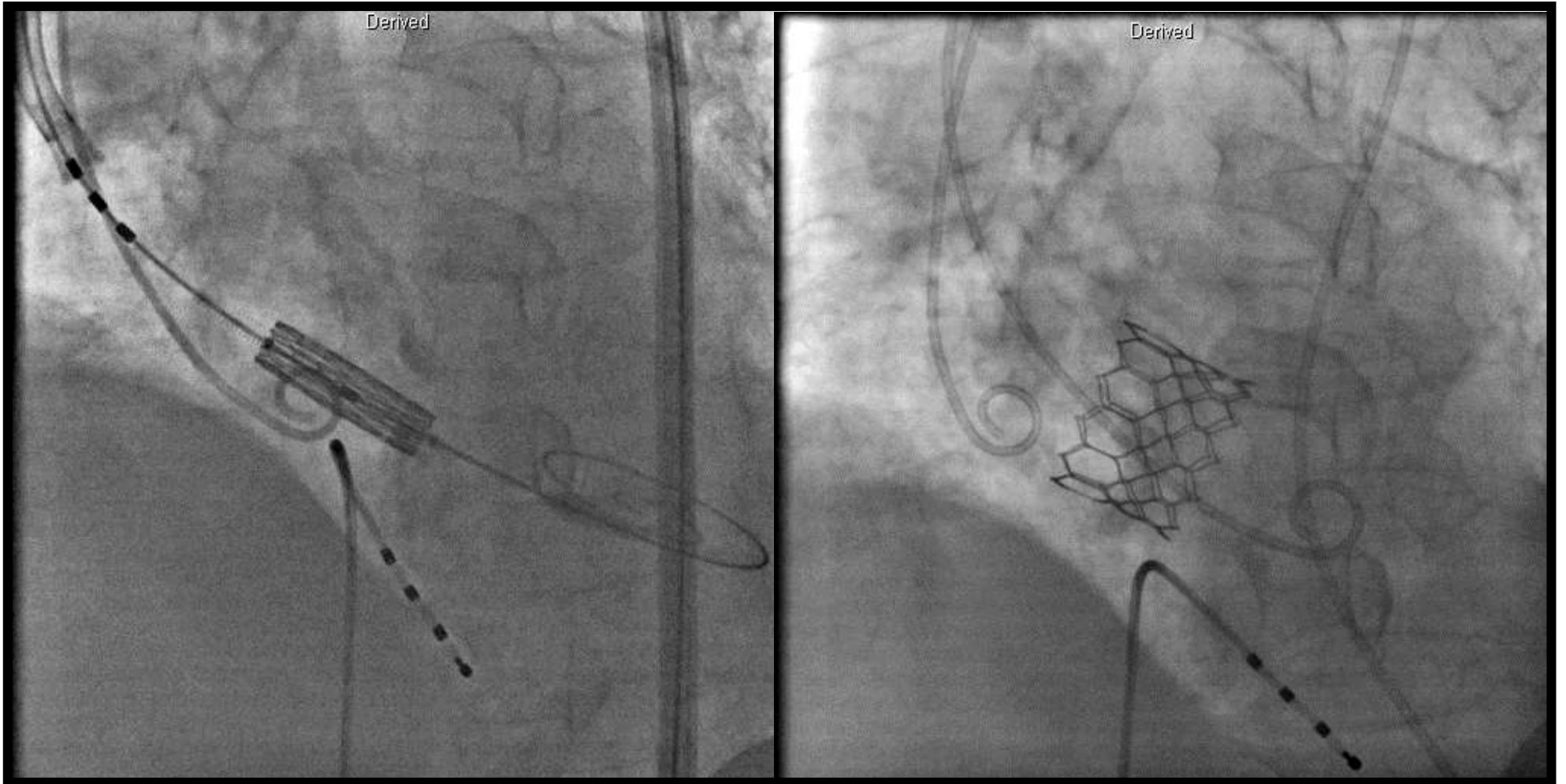
Annulus	542.0mm²		
Area driven diameter	26.3mm		
SAPIEN 3	29mm(nominal): 19.7% oversizing		
Oversizing Rate	26mm: (+1cc:-0.1% / +2cc:4.1%) 29mm: (-1cc:16.1% / -2cc:12.5%)		
SoV diameter	34.3mm	STJ diameter	25.8mm
LCA Height	14.9mm	RCA Height	20.9mm
Implant Angle	LAO33/CRA9		
Peripheral Artery	Rt:7.1-10.6 / Lt:6.9-9.1		

TAVI



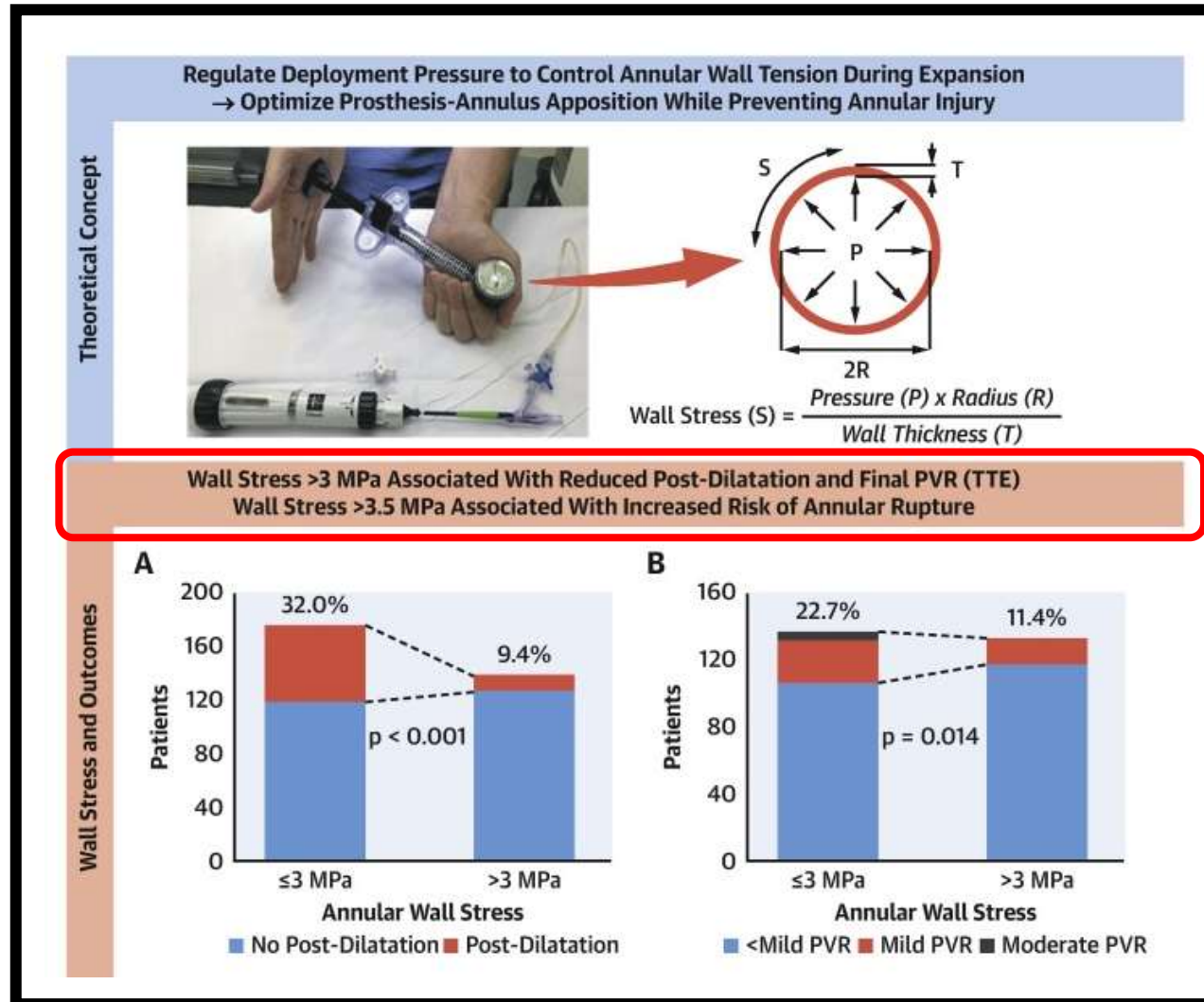
**SAPIEN 3 26mm
(2.5cc overfilling)**

TAVI

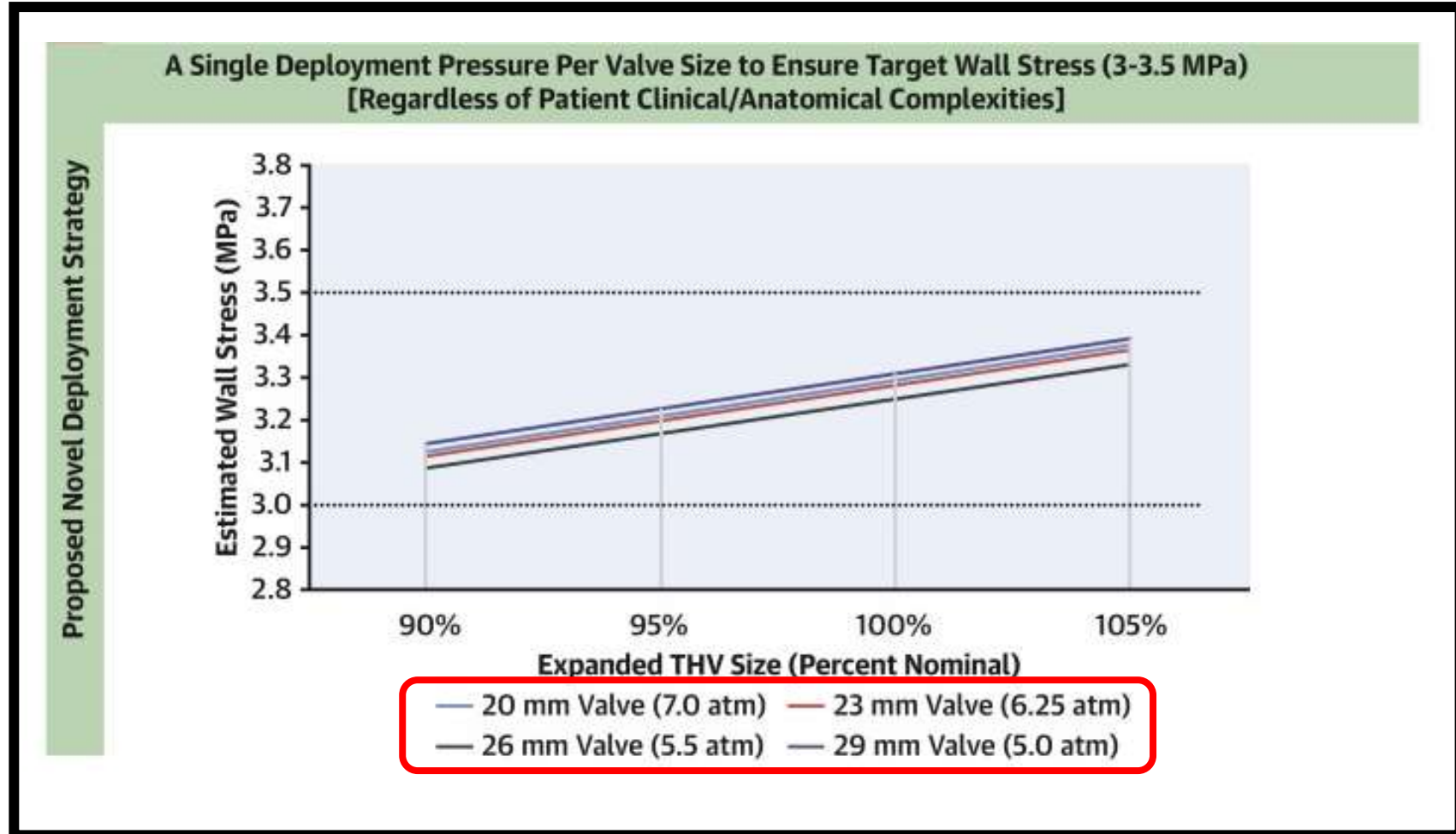


Balloon Rupture

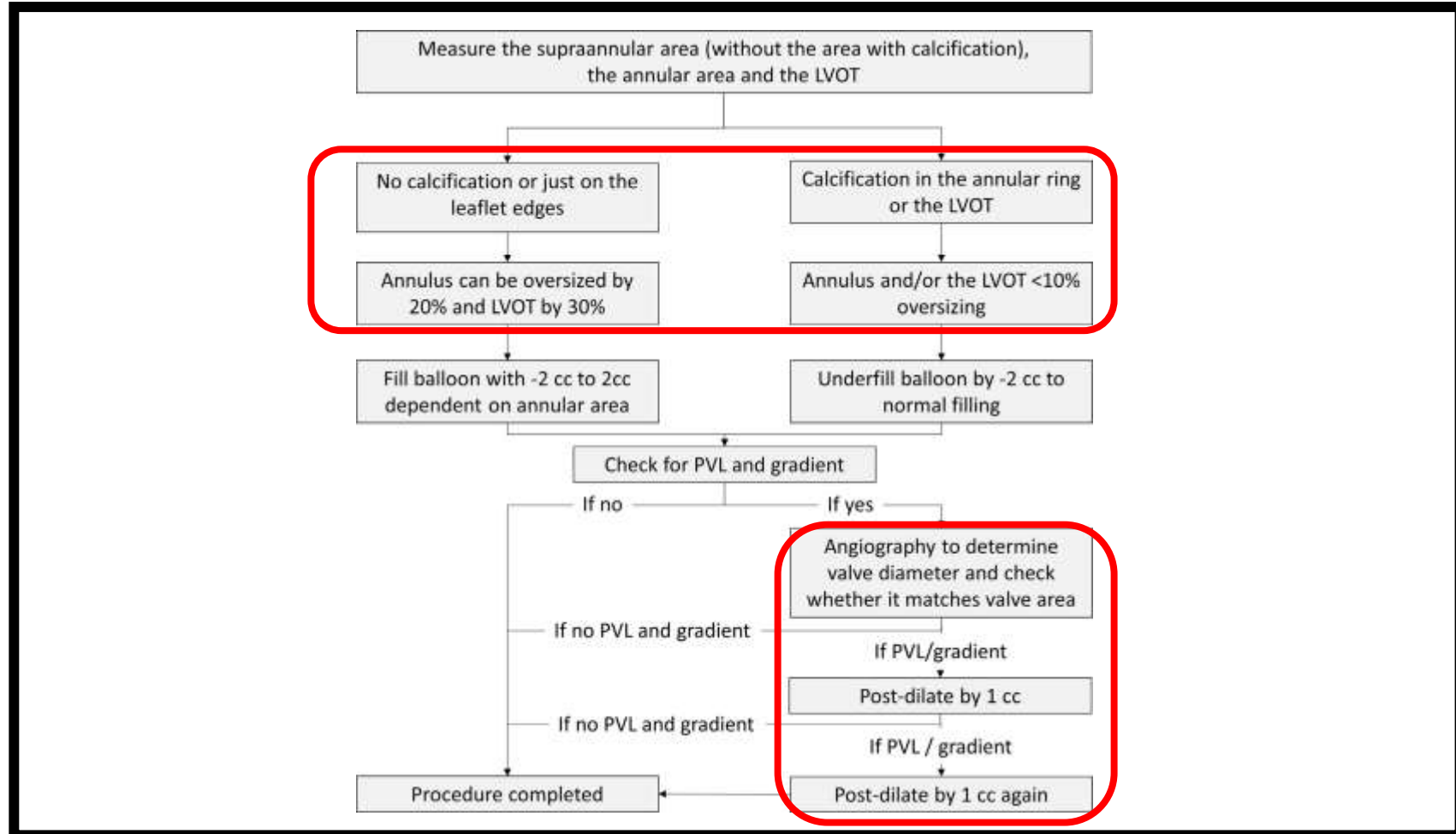
Optimal Ballooning of SAPINE 3 Valve



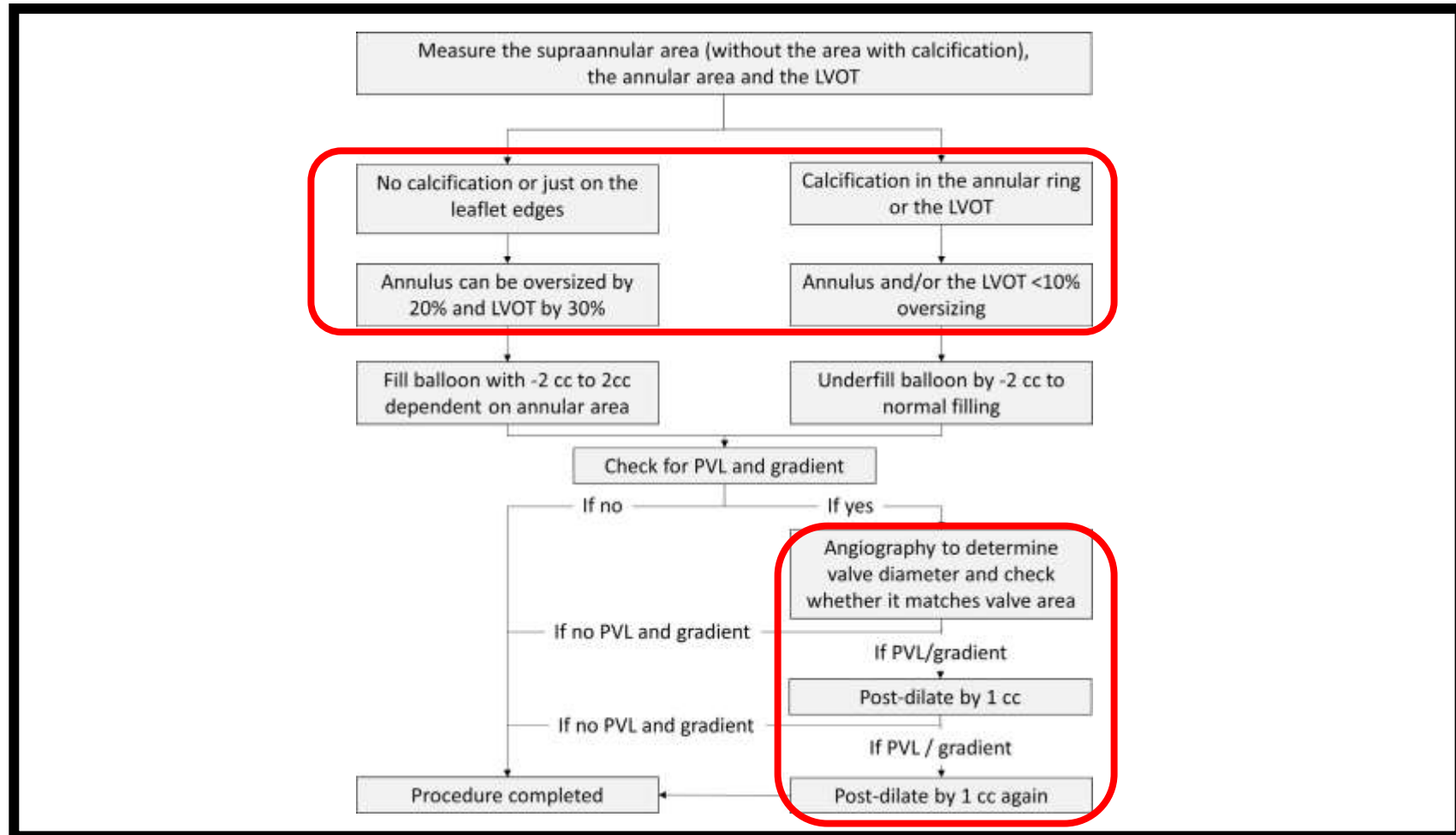
Optimal Sizing of SAPINE 3 Valve



Optimal Sizing of SAPINE 3 Valve



Optimal Sizing of SAPINE 3 Valve



Thank you for your attention